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ALLEGHENY NATIONAL FOREST
GYPSY MOTH SPRAY PROJECT

FINAL REPORT

1993

DMD

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INTRODUCTION

In 1993, 16,485 acres were aerially sprayed with undiluted Bacillus thuringiensis var. kurstaki (BTK) at the rate of 36 BIU (billion international units) per acre. A total of 2,865 acres received one application, and the remaining 13,620 acres where gypsy moth populations equaled or exceeded 1,500 egg masses per acre were given two applications 5 to 7 days apart. The spray project began on May 22nd and was completed 13 days later, on June 4th.

RESULTS

Table 1 characterizes the 1993 gypsy moth spray project on the Allegheny National Forest in terms of spray block size (acres), the number of BTK applications each block received, the average gypsy moth egg mass densities pre- and post-treatment and the percent population reduction per spray block.

Table 1.--1993 Gypsy Moth Spray Project Results, Allegheny NF, PA.

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Block #	Acres	Application	Pre-treatment	Post-treatment
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1 240 Double 1,500 80

9
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7

2 677 Double 1,500 220

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5
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4

3 4,066 Double 2,000 7

9
9
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7

4 1,653 Double 2,900 7

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9
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8

5 550 Double 1,600 127

9
2
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1

6 1,483 Double 3,800 127

9
6
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7

7 52 Double 1,500 280

8

					1 . 4
8	352	Double	1,500	0	1 0 0
9	346	Double	1,500	47	9 6 . 9
10	144	Double	1,500	47	9 6 . 9
11	877	Double	1,500	0	1 0 0
12	110	Double	1,500	0	1 0 0
13	157	Double	1,500	47	9 6 . 9
14	217	Single	1,000	13	9 8 . 7
15	461	Single	1,200	0	

					1 0 0
16	1,303	Single	400	0	1 0 0
17	239	Single	100	0	1 0 0
18	232	Double	1,500	0	1 0 0
19	1,270	Double	1,600	0	1 0 0
20	124	Double	2,000	0	1 0 0
21	89	Single	300	0	1 0 0
22	71	Single	200	0	1 0 0
23	363	Single	1,000	0	1 0 0

24	122	Single	960	0	1 0 0
25	1,068	Double	1,800	0	1 0 0
26	219	Double	1,500	0	1 0 0

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DISCUSSION

Gypsy moth egg mass densities per spray block were reduced an average of 98 percent considering all 26 blocks treated in 1993. The project reduced gypsy moth egg mass densities an average of 99 percent for the eight spray blocks treated once, and 97% for the 18 spray blocks treated twice. Every spray block exceeded the 80 percent standard used by the Allegheny NF in defining successful population reduction for any given spray block. How this compares with results achieved from earlier gypsy moth suppression projects on the Allegheny National Forest is shown in Table 2.

Table 2 covers projects from 1987 through 1993. It describes their attributes as to project size (acres treated and spray blocks), infestation trend, spray material and applications used, and average gypsy moth egg mass reduction for all blocks sampled (in parentheses) in a given year.

Table 2.--Gypsy Moth Suppression Results, 1987-1993 Allegheny NF, PA

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Year	1987	1988	1989	19921993
Population trend	Increasing	Declining	Declining	Increasing Decreasing
Spray acreage	29,500	7,900	42,200	2 3 , 3 6 2 16,485
Spray blocks	86	29	92	5926
BTK Single Appl	44% (84)	73% (18)	95% (12)	96% (16)99% (8)
BTK Double Appl	-- (0)	92% (10)	98% (45)	97% (40)97% (18)
Diiflubenzuron	N/A	N/A	99.5% (29)	N/AN/A

The dosage for BTK has varied during this period. From 1987 through 1989, BTK at 16 BIU was diluted in 128 ounces (1 gallon) of total formulation per acre for both single and double applications. Diiflubenzuron was applied in 1989 at the rate of 0.5 ounces in 128 ounces of total spray per acre. The dosage for BTK in 1992 was 32 BIU per acre applied undiluted at 96 ounces (3/4 gallon) per acre as a single application or was 24 BIU at 96 ounces per acre applied undiluted twice for the double application. The dosage for BTK in 1993 was 36 BIU per acre applied undiluted at 96 ounces (3/4 gallon) per acre either as a single or double application dependent on the gypsy moth population density.

Dosage, application rate, and number of applications against either increasing or decreasing populations in a given year may help explain a large part of the different egg mass reduction values achieved during this period. Other factors influencing success may be weather, the presence or absence of other influencing factors (nucleopolyhedrosis virus and/or Entomophaga maimaiga), or

the presence of predators and parasites.

Obviously, the failure of early gypsy moth spray projects (with BTK) to achieve the Allegheny National Forest standard or to match the high population reduction values with diflubenzuron, has been nearly eliminated in the last two years with the application of higher doses of undiluted BTK regardless of the gypsy moth population trend.